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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Arguments

1. Applicant's arguments filed 12/16/08 have been fully considered but they are not persuasive.

In the REMARKS filed 10/17/08, page 3, applicant has argued:

"To show disclosure of the claimed demultiplexer, the Examiner appears to allege that the demodulator 36" and the channel decoder 40" of Onggosanusi may be replaced with a demodulator 10 and a Viterbi decoder 15 of Fang. The Examiner states that the demodulator 10 of Fang provides I and Q components. Applicants submit that this is irrelevant. The signal received by the demodulator 36" is not space time block encoded. The signal received by the demodulator 36" is based on the output of the decoders 110. Since the decoders 110 decode a space time block code, the output of the decoders 110 is not space time block encoded. As such, should the demodulator 36" of Onggosanusi be replaced with the demodulator 10 of Fang, the output of the demodulator 10 would not be space time block encoded. Also, Fang only discloses outer decoding, not inner decoding. Thus, the replacement of the demodulators of Onggosanusi and Fang would not generate space time block encoded I and Q components, as claimed.

For at least the above reasons, the combination of Onggosanusi and Fang does not provide a demultiplexer that generates I and Q components, which are encoded based on a space time block code and an outer code. It is a longstanding rule that to establish a prima facie case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. In re Royka, 180 USPQ 143 (CCPA 1974), see MPEP § 2143.03.

Therefore, Claim 1 is allowable for at least the above reasons and regardless of whether joint decoding is recited in the claim. Claims 35 and 61 are allowable for at least similar reasons. Claims 2-8, 10-16, 36-46, 62-72, 84-94 and 96 ultimately depend from Claims 1, 35 and 61 and are allowable for at least the same reasons."

However, as indicated in the previous office action, in Onggosanusi, since the demodulated sequence is based on the received signal, which is a space time block code and an outer code, the signal components of the demodulated sequence after being "demodulated" would also be a signal based on a space time block code and an

outer code. Further, the incorporating of Fang for the teaching of quadrature and in-phase components is absolutely relevant. That is, as indicated previously as well, in case when, i.e. PSK is used as the modulation scheme in Onggosanusi (claim 25), a conventional technique of Fang could have been utilized to produce the quadrature and in-phase components for further processing. And this process can be appropriately applied anywhere in the receiving chain and should be well-known in the art. Further, there is no requirement as to what kind of decoding the decoder (i.e. the decoder in Fang) has to perform based on claim 1 of the present application, much less of a decoder in claim 1. Therefore, because of the above explanation, the replacement of elements 10 and 15 of Fang for elements 36" and 40" in Onggosanusi would yield a predictable result. Note, despite different terminology used between the claim of the present application and that of the reference, element 80 of Onggosasusi derotates signal constellation of the received signal, thus teaches the claimed “demodulator”; element 10 of Fang produces the quadrature and in-phase components from a received signal, thus teaches the claimed “demultiplexer”; and element 15 of Fang teaches decoding including "branch metric computation".

Further, on pages 4-5, applicant has argued:

“In maintaining the rejection of Claims 1-8, 10-16, 35-46, 61-72, 84-94 and 96, the Examiner alleges that joint decoding is not recited in the claims. Applicants submit that Claim 96 does recite joint decoding. This feature of Claim 96 appears to have been overlooked by the Examiner. Nevertheless, the recitation of joint decoding is irrelevant. The claims recite features that enable, begin and/or facilitate joint decoding. These features are not disclosed in Onggosanusi, Fang and/or a combination thereof. For

example, Claim 1 recites features A and B. Features A and B are not disclosed by the relied upon references.

Also, features A and B are beginning steps of a joint decoding process. Note that the claimed I and Q components are encoded based on a space time block code and an outer code. The separation of a demodulated symbol sequence (jointly encoded signal) into space time block encoded I and Q components allows a branch metric computation module to generate one-dimensional branch metrics based respectively on each of the I and Q components. A Viterbi decoder may than determine a most likely received sequence based on the one-dimensional branch metrics. The one-dimensional branch metrics are used instead of multi-dimensional branch metrics, which are common when performing separate decoding of space time block encoded and outer encoded signals. The use of one-dimensioned branch metrics reduces the computation complexity involved in the decoding process performed by, for example, a Viterbi decoder. See paragraph [0033] of the present application. Onggosanusi and Fang do not disclose steps of a joint decoding process.

The Examiner further alleges that joint decoding is not adequately described in the specification of the present application. Applicants respectfully disagree. In paragraphs [0007] and [0008] of the present application, separate decoding of space time block encoded and outer encoded signals is described. In paragraph [0028], an example demodulated symbol sequence after passing through a channel is shown as expression A. Joint decoding is mentioned in paragraph [0028] and then is described at least in paragraphs [0030]-[0034]. Paragraph [0030] describes the generation of I and Q components for symbols that are space time block encoded and outer encoded.

Paragraph [0033] provides example one-dimensional branch metrics, describes how the one-dimensional branch metrics are determined based on the I and Q components, and describes the use of a Viterbi decoder to determine a most likely sequence based on the one-dimensional branch metrics. The joint decoding process includes the generation of the I and Q components, the generation of the one-dimensional branch metrics, and the determining of decoded symbols based on the one-dimensional branch metrics. Thus, an adequate description is provided in the specification of the present application for joint decoding.

Thus, Claims 1-8, 10-16, 35-46, 61-72, 84-94 and 96 are further allowable for at least the above reasons."

Initially, applicant has indicated that the recitation "join decoding" is irrelevant. Further, such recitation was not overlooked by the examiner. However, the recitation "join decoding" was interpreted by the examiner, in light of the specification, as that the

original signal was encoded using more than one layer of encoding and that at decoding, the signal was "jointly decoding" in the receiver chain to obtain the useful data.

Moreover, in the claim and the specification of the present application, there is no clear explanation of what is meant by “joint decoding”. For example, if the prior art performed decoding in two steps and the present application does it in one step, then more weight would be given to such recitation. However, this is now the case. As indicated previously in the office action, Fig. 3 of the present application shows the decoding process, which includes generating quadrature and in-phase components, branch metric calculation and Viterbi decoding. If this is what "joint decoding" means, then the examiner believes that the aforementioned combination of Onggisanusi also meets such limitation.

Page 5, applicant has further argued:

“The Examiner further alleges that when phase shift keying (PSK) is used, some mechanism (such as a demultiplexer) must be utilized for quadrature demodulating a signal to provide I and Q components. PSK may be used by an outer encoder when encoding a symbol sequence. Outer encoding is independent of space time block encoding. Likewise, outer decoding is typically independent of space time block decoding, as shown and described in Onggosanusi. Thus, regardless of whether it would have been obvious to use a demultiplexer to generate I and Q components when performing outer decoding for PSK modulated signals, it would not have been obvious to use a demulUplexer to generate I and Q components for a jointly encoded signal. Onggosanusi and Fang do not disclose joint decoding or performing I and Q separation of jointly encoded signals.

Thus, Claims 1-8, 10-16, 35-46, 61-72, 84-94 and 96 are further allowable for at least the above reasons.”

Again here, the examiner would like to assert that the Fang was incorporated into Onggosanusi only to purely teach the generating of quadrature and in-phase component, as conventionally known when, for example, PSK modulation is used.

For the rest of the argument in the REAMARKS, pages 7-8, the above explanation has already addressed these issues.

Terminal Disclaimer

2. The terminal disclaimer filed on 10/17/08 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of the full statutory term prior patent No. 7,133,473 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dac V. Ha whose telephone number is 571-272-3040. The examiner can normally be reached on 4/4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Dac V. Ha/
Primary Examiner, Art Unit 2611